said binder material joining together said particles of said hard constituent material, said substrate further comprising an unetched surface portion;

removing a portion of said binder material from said unetched surface portion to produce an etched surface portion having voids between said particles by contacting said unetched surface portion with concurrent flows of at least a first gas and a second gas, said first gas capable of removing said binder material from said substrate, said second gas incapable of reacting with said substrate or changing the oxidation state of said substrate during removal of said portion of said binder material; and

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adhering a coating to at least a portion of said etched surface portion of said substrate, at least a portion of said coating being deposited within at least a portion of said voids, said voids lacking eta phase deposits therein.

43. (Amended) The object of claim 39 wherein said hard constituent material comprises one or more materials selected from the group consisting of:

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a carbide material selected from the group consisting of tungsten carbide, titanium carbide, tantalum carbide, niobium carbide, vanadium carbide, chromium carbide, molybdenum carbide, and iron carbide;

a carbonitride of a refractory metal;

a nitride of a refractory metal;

a carbonitride of an element selected from the group consisting of W, Ti, Ta, Nb, V, Cr, Mo, and Fe;

an oxide of an element selected from the group consisting of aluminum, zirconium, and magnesium;

a boride of an element selected from the group consisting of aluminum, zirconium, and magnesium;

a material comprising molybdenum; and

a material comprising tungsten.

B2

44. (Amended) The object of claim 39 wherein said hard constituent material of said substrate comprises WC, said binder material comprises cobalt, said first gas comprises hydrogen chloride gas, and said second gas comprises nitrogen gas.

46. (Amended) The object of claim 39 wherein said coating enhances the wear resistance of said substrate and is comprised of one or more materials selected from the group consisting of TiC, TiN, TiCN, diamond, Al_2O_3, TiAlN, HfN, HfCN, HfC, ZrN, ZrC, ZrCN, Cr_3C_2, CrN, and CrCN.

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Add new claim 49, as follows:

49. (New) A coated substrate produced by a method comprising:

providing a substrate having particles of a hard constituent comprising tungsten carbide in a binder phase, said binder phase comprising cobalt;

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contacting at least a portion of an unetched surface of the substrate with a gas flow free of hydrogen gas, said gas flow comprising hydrogen chloride and nitrogen, to thereby remove at least a portion of said binder phase from said